

In re Patent Application of:
BELL ET AL.
Serial No. 10/719,203
Filing Date: November 21, 2003

REMARKS

The Examiner is thanked for the thorough examination of the present application. Independent Claims 1 and 19 have been amended to recite a mobile data collection system for use in a vehicle as it travels along a road. No new matter has been added. Dependent Claim 10 has been amended to correct a minor informality as helpfully pointed out by the Examiner. The patentability of the claims is discussed in detail below.

I. The Amended Claims

The invention is directed to a mobile data collection system for use in a vehicle as it travels along a road. The mobile data collection system includes, as in amended independent Claim 1, for example, a positioning system to generate position and time data as the vehicle travels along the road, and a down-looking line scan camera for mounting on the vehicle to obtain a series of line scan images of the road as the vehicle travels therealong. The system also includes a data collection controller connected to the positioning system and the line scan camera to associate line scan images with corresponding position and time data as the vehicle travels along the road.

Independent Claim 11 is directed to a related mobile road-centerline data collection and processing system. Independent Claim 19 is a method counterpart of independent Claim 1 and has been similarly amended.

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II. The Claims Are Patentable

The Examiner rejected independent Claims 1 and 19 as being unpatentable over Sakuma et al. Sakuma et al. is directed to an apparatus and method for measuring the length and the relative moving speed of an object whereby a plurality of line scan cameras are synchronously operated and positioned transverse to the given track of a moving object, such as a vehicle. Framed images of the moving vehicle are correlated to determine a moving time interval. A relative moving speed of the vehicle is thereby determined.

Applicants respectfully submit that Sakuma et al. does not disclose a down-looking line scan camera to take images of the road as the vehicle travels therealong, as in the claimed invention. Instead, Sakuma et al. discloses line scan cameras that are positioned in a moving vehicle so as to take images of stationary vehicles (FIG. 2), or conversely, wherein the line scan cameras are positioned on a fixed overhead support to collect images of a moving vehicle (FIG. 19).

The Examiner further rejected independent Claim 11 as being unpatentable over Sakuma et al., in view of Kimura and Martin. As discussed above, Sakuma et al. is directed toward an apparatus and method for measuring the length and the relative moving speed of an object. The Examiner correctly recognized that Sakuma et al. does not disclose a down-looking line scan camera with an attached wide angle lens mounted on the vehicle to obtain a series of line scan images of the road. The Examiner then turned to Martin for this noted deficiency.

Martin is directed toward surveillance systems whereby at least a portion of a captured image is transformed to

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eliminate distortion while magnifying the selected portion of the image. Martin is preferably implemented in the form of a single integrated circuit incorporating an image sensor array and an application specific integrated circuit coupled thereto. Martin further discloses using a fisheye lens as one method of capturing a video image. The Examiner further recognized that even a combination of Sakuma et al. and Martin does not disclose the claimed invention since the combination does not disclose an image processor to identify and mark road features in the line scan images.

The Examiner then turned to Kimura for this noted deficiency. Kimura is directed to a navigation apparatus that allows the map matching to determine a vehicle position after encountering a fork. The apparatus has a CCD camera for taking images of a road and includes a lane marker detector.

Applicants' submit that the Examiner's combination of the prior art references is improper. A person having ordinary skill in the art would not be motivated to combine the measuring of the length and the relative moving speed of an object from Sakuma et al. with the distortion eliminating surveillance system of Martin and the map matching of Kimura to arrive at the mobile mapping and road database management system as in the claimed invention.

Applicants' further submit the Examiner's proposed combination of prior art references would destroy the operability of the primary reference, Sakuma et al. A fisheye lens distorts straight lines, and the overall image often suffers from distortion. (See e.g. the object of Martin). Employing a fisheye lens in Sakuma et al. would destroy the

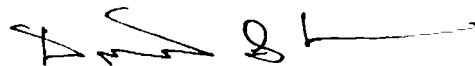
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ability of the image acquiring apparatus to obtain clear images in short interval in order to determine a starting and ending point to obtain a relative moving speed. Moreover, Applicants' submit the Examiner is using hindsight reconstruction based on Applicants' own specification to combine disjoint pieces of the prior art.

III. Conclusions

In view of the amendments and arguments presented above, it is submitted that all of the claims are patentable. Accordingly, a Notice of Allowance is respectfully requested in due course. Should any informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,



DAVID S. CARUS
Reg. No. 59,291
Allen, Dyer, Doppelt, Milbrath
& Gilchrist, P.A.
255 S. Orange Avenue, Suite 1401
Post Office Box 3791
Orlando, Florida 32802
407-841-2330
407-841-2343 fax
Attorney for Applicants